Remarks

The Office Action mailed January 30, 2003 has been carefully reviewed and the foregoing amendment has been made in consequence thereof. A submission of marked up paragraphs and Claims is submitted herewith.

Claims 1-65 are pending in this application. Claims 12-30 and 49-53 have been withdrawn from consideration. Claims 1-11, 31-48, and 54-65 stand rejected. Claims 3, 45, and 61 have been cancelled.

The rejection of Claims 1, 2, 4-10, 31-35, 41-44 under 35 U.S.C. § 102(b) as being anticipated by Bessler et al., U.S. Patent No. 5,410,230 (hereinafter referred to as "Bessler") is respectfully traversed.

Bessler describes an ECM drive system 300 that may be used for driving a compressor motor, fan motor, blower motor, or draft inducer fan motor. System 300 includes a microprocessor 302 for receiving an on/off temperature signal. A read only memory (ROM) 304 is used to control the operation of the microprocessor 302. Microprocessor 302 provides a speed or torque control signal via line 308 to an electronically commutated motor 310 to control the speed or torque of motor 310. Motor 310 includes a rotatable assembly that is mechanically connected via shaft 312 to the particular compressor, blower, fan or draft inducer fan motor which it is driving. System 300 also includes a power supply 314 which provides relatively low voltage power to operate the microprocessor 302 and also provides relatively higher voltage power to power electronically commutated motor 310. Motor 310 also includes a circuit 314 for back electromotive force (BEMF) sensing which provides a speed signal to microprocessor 302.

Claim 1 recites a method for interfacing an electric motor to a controller using an electrical interface circuit, the interface circuit including a controller circuit and a motor control circuit, the controller circuit including a transmitter circuit and a receiver circuit, the motor control circuit including a transmitter circuit and a receiver circuit, and the interface circuit electrically coupled to the controller and the electric motor, in combination with a method comprising the steps of "receiving a signal from the controller...adjusting a level of

the received signal to a desired level...converting the signal from the controller to at least one of an infrared signal and an RF signal...outputting the signal to control the electric motor...."

Bessler does not describe nor suggest a method for interfacing an electric motor to a controller using an electrical interface circuit, wherein the interface circuit includes a controller circuit and a motor control circuit, the controller circuit includes a transmitter circuit and a receiver circuit, the motor control circuit includes a transmitter circuit and a receiver circuit, and the interface circuit is electrically coupled to the controller and the electric motor, in combination with a method including the steps of receiving a signal from the controller, adjusting a level of the received signal to a desired level, converting the signal from the controller to at least one of an infrared signal and an RF signal, and outputting the signal to control the electric motor, receiving a signal from the electric motor and transmitting the received signal from the electric motor to the controller. Specifically, Bessler does not describe nor suggest converting an electrical signal from the controller to at least one of an infrared signal and an RF signal. Rather, in contrast to the present invention, Bessler describes an ECM that includes a variable speed motor that is responsive to a motor control signal provided by a microprocessor. For at least the reasons set forth above, Claim 1 is submitted to be patentable over Bessler.

Claims 2 and 4-10 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 2 and 4-10 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2 and 4-10 likewise are patentable over Bessler.

Claim 31 recites an electrical interface circuit comprising "a controller circuit electrically coupled to a motor control circuit...said controller circuit comprising a transmitter circuit and a receiver circuit...said controller circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal".

Bessler does not describe nor suggest an electrical interface circuit including a controller circuit electrically coupled to a motor control circuit, wherein the controller circuit includes a transmitter circuit and a receiver circuit, and wherein the controller circuit is configured to convert a voltage signal to at least one of an infrared signal and an RF signal. Specifically, Bessler does not describe nor suggest a controller circuit configured to convert a

voltage signal to at least one of an infrared signal and an RF signal. For at least the reasons set forth above, Claim 31 is submitted to be patentable over Bessler.

Claims 32-35 and 41-44 depend, directly or indirectly, from independent Claim 31. When the recitations of Claims 32-35 and 41-44 are considered in combination with the recitations of Claim 31, Applicants submit that dependent Claims 32-35 and 41-44 likewise are patentable over Bessler.

For the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 1, 2, 4-10, 31-35, 41-44 be withdrawn.

The rejection of Claims 3, 11, 40, 45-48, and 54-65 under 35 U.S.C. § 103 as being unpatentable over Bessler in view of Kliman et al., U.S. Patent No. 5,986,379 (hereinafter referred to as "Kliman") is respectfully traversed.

Bessler is described above. Kliman describes a motor monitoring system 10 including a pair of similar motor units 12 and 14. One motor unit 12 is located at the site of the motor 16. An mcc unit 14 is located remotely from the motor 16 at a motor control (MC) 19 or Motor Control Center (MCC) 18, such as a circuit breaker cabinet, transformer or other location where motor 16 is controlled such that predetermined motor parameters may be safely measured. Motor unit 12 provides a master signal that allows both units 12 and 14 to collect data in synchronism. Mcc unit 14 is a "slave" unit that is, at least partially, controlled by unit 12. Motor unit 12 receives data signals from the stimulus and measurement instrumentation unit 22, which in turn captures signals from the sensors that are in contact with the motor or in the immediate vicinity of the motor.

A radio frequency (RF) sensor 32 senses RF motor emissions, which are indicative of electrical faults developing in motor 16. Such RF emissions, when displayed relative to the drive waveform, indicate motor insulation deterioration or faults in the motor windings of AC motors. RF motor activity is also associated with commutator quality in DC motors, in that sparking by a DC motor emits RF spikes that are detected by the RF sensor 32. The RF sensor may be an antenna, a resistor, inductor or high frequency current transformer (in series with a suitable blocking capacitor if needed) connected between the motor lines, or from a motor line to ground.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been an obvious to one of ordinary skill in the art to modify Bessler according to the teachings of Kliman. More specifically, as is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Neither Bessler nor Kliman describe or suggest the claimed combination. Furthermore, in contrast to the assertion within the Office Action, Applicants respectfully submit that it would not be obvious to one skilled in the art to combine Bessler with Kliman because there is no motivation to combine the references suggested in the art. Rather, the Examiner has not pointed to any prior art that teaches or suggests to combine the disclosures, other than Applicants' own teaching. Only the conclusory statement that "[i]t would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the teachings of Kliman et al. with the apparatus and method of Bessler et al., because Kliman et al. provide the use of RF signals, wherein signals can be wirelessly transmitted, thereby enhancing the invention." suggests combining the disclosures.

Applicants respectfully submit however, that the prior art teaches away from the present invention. More specifically, neither Bessler nor Kliman describe or suggest the step of converting an electrical signal from the controller to at least one of an infrared signal and an RF signal.

As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown. Specifically, the Examiner has not pointed to any prior art that teaches or suggests a reasonable expectation of success or motivation in combining the disclosures, other than Applicants' own teaching.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. The present Section 103 rejection is based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically, Bessler is cited for a microprocessor controlling a variable speed motor via a line, and Kliman is cited for partial discharge analysis of a motor. Since there is no teaching, suggestion, or motivation in the cited art for the claimed combination, the Section 103 rejection appears to be clearly based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection of Claims 3, 11, 40, 45-48, and 54-65 be withdrawn.

Notwithstanding the above, the rejection of Claims 3 and 11 under 35 U.S.C. § 103(a) as being unpatentable over Kliman in view of Bessler is further traversed on the grounds that neither Kliman and Bessler, considered alone or in combination, do not describe or suggest the claimed invention. Specifically, Claims 3 and 11 depend from Independent Claim 1 which recites a method for interfacing an electric motor to a controller using an electrical interface circuit, the interface circuit including a controller circuit and a motor control circuit, the controller circuit including a transmitter circuit and a receiver circuit, the motor control circuit including a transmitter circuit and a receiver circuit, and the interface circuit electrically coupled to the controller and the electric motor, in combination with a method comprising the steps of "receiving a signal from the controller...adjusting a level of the received signal to a desired level...converting the signal from the controller to at least one of an infrared signal and an RF signal...outputting the signal to control the electric motor..."

Neither Bessler nor Kliman, considered alone or in combination, describe or suggest a method for interfacing an electric motor to a controller using an electrical interface circuit, the interface circuit including a controller circuit and a motor control circuit, the controller circuit including a transmitter circuit and a receiver circuit, the motor control circuit including

a transmitter circuit and a receiver circuit, and the interface circuit electrically coupled to the controller and the electric motor, in combination with a method including the steps of receiving a signal from the controller, adjusting a level of the received signal to a desired level, the step of adjusting a level of the received signal further including the step of converting an electrical signal from the controller to at least one of an infrared signal and an RF signal, outputting the signal to control the electric motor, receiving a signal from the electric motor and transmitting the received signal from the electric motor to the controller.

Specifically, neither Bessler nor Kliman, considered alone or in combination, describe or suggest the step of adjusting a level of the received signal to a desired level. Furthermore, neither Bessler nor Kliman, considered alone or in combination, describe or suggest the step of converting an electrical signal from the controller to at least one of an infrared signal and an RF signal. Rather, in contrast to the present invention, Bessler describes an ECM 310 constituting a variable speed motor responsive to a motor control signal provided by microprocessor 302 via line 308 for driving the various portions of the system in response to the motor control signal. Kliman describes detecting motor faults through partial discharge analysis. Furthermore, and in contrast to the present invention, Kliman describes using RF emissions as a detector of motor faults and does not describe nor suggest using RF signals for communication. Whereas the present invention describes converting an electrical signal to at least one of an infrared signal and a RF signal for communication from the controller to the motor. Accordingly, Applicants respectfully submit that Claim 1 is patentable over Bessler in view of Kliman.

Claims 3 and 11 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 3 and 11 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 3 and 11 likewise are patentable over Bessler in view of Kliman.

Claims 40, and 45-48 depend from Independent Claim 31 which recites an electrical interface circuit comprising "a controller circuit electrically coupled to a motor control circuit, said controller circuit comprising a transmitter circuit and a receiver circuit, said motor control circuit comprising a transmitter circuit and a receiver circuit, said interface circuit electrically connected to a controller and electrically connected to an electric motor,

said controller circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal".

Neither Bessler nor Kliman, considered alone or in combination, describe or suggest an electrical interface circuit including a controller circuit electrically coupled to a motor control circuit, the controller circuit including a transmitter circuit and a receiver circuit, the motor control circuit including a transmitter circuit and a receiver circuit, the interface circuit electrically connected to a controller and electrically connected to an electric motor, the controller circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal.

Specifically, neither Bessler nor Kliman, considered alone or in combination describe nor suggest a controller circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal. Rather, in contrast to the present invention, Bessler describes an ECM 310 constituting a variable speed motor responsive to a motor control signal provided by microprocessor 302 via line 308 for driving the various portions of the system in response to the motor control signal. Kliman describes detecting motor faults through partial discharge analysis. Furthermore, and in contrast to the present invention, Kliman describes using RF emissions as a detector of motor faults and does not describe nor suggest using RF signals for communication. Whereas the present invention describes converting an electrical signal to at least one of an infrared signal and a RF signal for communication from the controller to the motor. Accordingly, Applicants respectfully submit that Claim 31 is patentable over Bessler in view of Kliman.

Claims 40 and 46-48 depend, directly or indirectly, from independent Claim 31. When the recitations of Claims 40 and 46-48 are considered in combination with the recitations of Claim 31, Applicants submit that dependent Claims 40 and 46-48 likewise are patentable over Bessler in view of Kliman.

Claim 54 recites "an electrical interface circuit for a HVAC system comprising an electronically commutated motor, said electrical interface comprising a controller circuit electrically connected to a motor control circuit using a serial four-wire communications cable, said controller circuit comprising a transmitter circuit and a receiver circuit, said controller circuit configured to convert a voltage signal to at least one of an infrared signal

and an RF signal, said motor control circuit comprising a transmitter circuit including a first optocoupler and a receiver circuit including a second optocoupler, said interface circuit electrically connected to a controller and electrically connected to said electronically commutated motor, wherein said first and second optocouplers configured to isolate signals between said motor control circuit and said electronically commutated motor and said electrical interface configured to interrogate said electronically commutated motor to acquire status and diagnostic information".

Neither Bessler nor Kliman, considered alone or in combination, describe or suggest an electrical interface circuit for a HVAC system including an electronically commutated motor, the electrical interface including a controller circuit electrically connected to a motor control circuit using a serial four-wire communications cable, the controller circuit including a transmitter circuit and a receiver circuit, the controller circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal, the motor control circuit including a transmitter circuit including a first optocoupler and a receiver circuit including a second optocoupler, the interface circuit electrically connected to a controller and electrically connected to the electronically commutated motor, wherein the first and second optocouplers configured to isolate signals between the motor control circuit and the electronically commutated motor and the electrical interface configured to interrogate the electronically commutated motor to acquire status and diagnostic information.

Specifically, neither Bessler nor Kliman, considered alone or in combination describe nor suggest a controller circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal. Rather, in contrast to the present invention, Bessler describes an ECM 310 constituting a variable speed motor responsive to a motor control signal provided by microprocessor 302 via line 308 for driving the various portions of the system in response to the motor control signal. Kliman describes detecting motor faults through partial discharge analysis. Furthermore, and in contrast to the present invention, Kliman describes using RF emissions as a detector of motor faults and does not describe nor suggest using RF signals for communication. Whereas the present invention describes converting an electrical signal to at least one of an infrared signal and a RF signal for communication from the controller to the motor. In addition, neither Bessler nor Kliman describe or suggest the use of optocouplers. Even if optocouplers were described or suggested by Bessler or Kliman, optocouplers utilize visible light waves, whereas infrared

signals are based on infrared waves and RF signals are based on radio waves. Accordingly, Applicants respectfully submit that Claim 54 is patentable over Bessler in view of Kliman.

Claims 55-57 depend, directly or indirectly, from independent Claim 54. When the recitations of Claims 55-57 are considered in combination with the recitations of Claim 54, Applicants submit that dependent Claims 55-57 likewise are patentable over Bessler in view of Kliman.

Claim 58 recites "an electrical interface circuit for a HVAC system comprising an electronically commutated motor, said electrical interface comprising a controller circuit electrically connected to a motor control circuit using a digital wireless interface, said controller circuit comprising a transmitter circuit and a receiver circuit, said controller circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal, said motor control circuit comprising a transmitter circuit including a first optocoupler and a receiver circuit including a second optocoupler, said interface circuit electrically connected to a controller and electrically connected to said electronically commutated motor, wherein said first and second optocouplers configured to isolate signals between said motor control circuit and said electronically commutated motor and said electrical interface configured to interrogate said electronically commutated motor to acquire status and diagnostic information".

Neither Bessler nor Kliman, considered alone or in combination, describe or suggest an electrical interface circuit for a HVAC system including an electronically commutated motor, the electrical interface including a controller circuit electrically connected to a motor control circuit using a digital wireless interface, the controller circuit including a transmitter circuit and a receiver circuit, the controller circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal, the motor control circuit including a transmitter circuit including a first optocoupler and a receiver circuit including a second optocoupler, the interface circuit electrically connected to a controller and electrically connected to the electronically commutated motor, wherein the first and second optocouplers configured to isolate signals between the motor control circuit and the electronically commutated motor and the electrical interface configured to interrogate the electronically commutated motor to acquire status and diagnostic information.

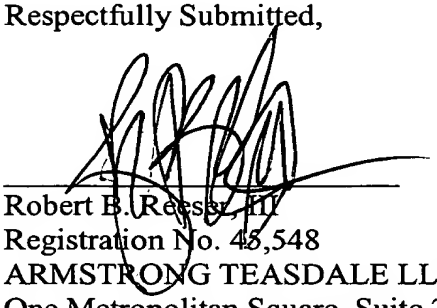
Specifically, neither Bessler nor Kliman, considered alone or in combination describe nor suggest a controller circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal. Rather, in contrast to the present invention, Bessler describes an ECM 310 constituting a variable speed motor responsive to a motor control signal provided by microprocessor 302 via line 308 for driving the various portions of the system in response to the motor control signal. Kliman describes detecting motor faults through partial discharge analysis. Furthermore, and in contrast to the present invention, Kliman describes using RF emissions as a detector of motor faults and does not describe nor suggest using RF signals for communication. Whereas the present invention describes converting an electrical signal to at least one of an infrared signal and a RF signal for communication from the controller to the motor. In addition, neither Bessler nor Kliman describe or suggest the use of optocouplers. Even if optocouplers were described or suggested by Bessler or Kliman, optocouplers utilize visible light waves, whereas infrared signals are based on infrared waves and RF signals are based on radio waves. Accordingly, Applicants respectfully submit that Claim 54 is patentable over Bessler in view of Kliman.

Claims 59-60 and 62-65 depend, directly or indirectly, from independent Claim 58. When the recitations of Claims 59-60 and 62-65 are considered in combination with the recitations of Claim 58, Applicants submit that dependent Claims 59-60 and 62-65 likewise are patentable over Bessler in view of Kliman.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 3, 11, 40, 45-48, and 54-65 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



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